8th ISCA International Conference on Computer Applications in Industry and Engineering 1995

Honolulu, Hawaii, USA 29 November-1 December 1995

Editors:

A. Goel

ISBN: 978-1-61839-831-4

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (1995) by the International Society for Computers and Their Applications All rights reserved. Reproduction in any form without the written consent of ISCA is prohibited.

Original ISBN: 1-880843-14-5 (Out of Print)

Reprint ISBN: 978-1-61839-831-4

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the International Society for Computers and Their Applications at the address below.

International Society for Computers and Their Applications 975 Walnut Street, Suite 132 Cary, NC 27511-4216

Phone: (919) 467-5559 Fax: (919) 467-3430

isca@ipass.net

Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA

Phone: 845-758-0400 Fax: 845-758-2634

Email: curran@proceedings.com Web: www.proceedings.com

INTERNATIONAL SOCIETY FOR COMPUTERS **AND THEIR APPLICATIONS**

International Conference on Computer Applications in Industry and Engineering Honolulu, Hawaii USA Nov. 29 - Dec. 1, 1995

TECHNICAL PAPER INDEX

Se	ssion WA-1: Image Processing and Computer Vision Systems				
1.	Multi-Level Masks for Near Real-Time Video Frame Analysis Dwight D. Egbert, Chu Boon-Hai, Randel J. Stevens and Nelson G. Publicover (University of Nevada)	. 1			
2.	Algorithms for the Generation and Display of Polar Radar Images James M. Henson, Paul A. Stuopis (University of Nevada) and Kenneth Hall (U. S. Army Waterways Experiment Station)	. 5			
3.	A Real-Time System for Textured Object Recognition Using Distributed Systems J. You, W. P. Zhu (University of South Australia), H. A. Cohen (La Trobe University) and E. Pissaloux (Universite Paris XI)	. 9			
4	An Inexpensive Real-Time Machine Vision Gauging System Robert P. M. Craven, Christine Chaney and James E. Smith (West Virginia University)	13			
5	Terrain Reconstruction from Binocular Stereo Image Pairs Ta-Yu Jack Yuan and Gordon K. Lee (North Carolina State University)	17			
Se	ession WA-2: Mechanical Systems Modeling				
1.	Sealing Analysis of the Beta Rand Cam™ Engine Vane Christopher H. Braden, Gregory J. Thompson, James E. Smith and Victor H. Mucino (West Virginia University)	21			
2.	A Simplified Model for Crashworthiness with Emphasis on Passenger-Vehicle Interaction Toru Aida, Victor H. Mucino and James E. Smith (West Virginia University)	:25			
3.	Fuzzy Spark Advance Controller for SI Engine Devinder Kaur, Bin Lin (The University of Toledo)	29			
4	Impact Response of a Cylindrical Shell: Mass/Velocity Variations with Constant Momentum Septime C. P. E. Garel, Victor H. Mucino, Randolph A. Churchill and James E. Smith (West Virginia University)	33			
:5	A Vehicle Front-End Crashworthinless Simulator Randolph A. Churchill, Ravipati Anand, Mark Kenamond, Victor Mucino and James E. Smith (West Virginia University)	37			

Session WP-1: Neural Networks 1. Self-organizing Artificial Neural Networks in Power Systems 2. The Application of Genetic Algorithm to Design the Optimal Structure of Radial Basis Function Neural Networks 3. Theory and Application of a Noniterative, Real-Time-Learning Neural Network 4. Neural Network Approach for Reasoning with Abstract High-level Knowledge 5. Use of a Neural Network Model in the Evaluation of Carotid Artery Stenosis M. E. Cohen (California State University, Fresno and University of California, San Francisco), D. L. Hudson (University of California, San Francisco) and M. F. Anderson (California State University, Fresno and Session WP-2: Environmental Systems and Databases 1. Detection of Internal Defects in Hardwood Logs by Computer Analysis of Axial CT Images 2. Performance of a VME-based Parallel Processing LIDAR Data Acquisition System K. R. Moore (Los Alamos National Laboratory), D. M. Alde (Pojoaque Scientific Assoc.), W. T. Buttler, M. P. Caffrey 3. Learning to Classify a Dynamic Database of Job Openings 4. Automation of Fine Concurrency in Object-Oriented Databases 5. Numerical Simulation of the Flow of Fluidized Bed Ash Grout Session TA-1: Computer Architectures / Fault Simulation

ii

Tri Caohuu, H. S. Ramagopal, and Ravi Ramanathaswamy (San Jose State University)94

1. Fault-Tolerance Scheduling in Real-Time Systems

2. Intelligent Memory Controllers for Modularly Configured Attached Processors

5. Formal Testing of Fault Tolerance in a Space-Based Communications System

3. Multi-Level Cache with Most Frequently Used Policy: A New Concept in Cache Design

Rex E. Gantenbein (University of Wyoming), Dimiter R. Avresky (Texas A&M University), and Sung Y. Shin

4. On the Design and Implementation of a Morphology Processor Using Systolic Mesh Architecture

Session TA-2: Control Systems 1. A Digital Attitude Control System for NASA Sounding Rockets 2. A Three-Degree of Freedom Manipulator Crane for the MMRC Mars Rover 3. Validation of an Adaptive Leaky Bucket Algorithm 4. Maximum Absolute Values of Dynamic Variables in Piecewise Linear Control Systems Session TP-1: Network Communication 1. ISDN: An Efficient Network Technology to Deliver Information Services Srividhya Narayanan, Nikhil Kodkani, Devendra Rajkumar Jaisinghani, Sung-Yong Park, Young-ki Hwang and 2. Designing an ISDN-ATM Gateway 3. Multithreaded Client/Server Computing 4. Task Partitioning of Multichannel, Distributed, Real-Time Systems 5. Communication Alternatives for a Distributed Real Time System Session TP-2: Software Development 1. Flexible Sharing, Co-Objects and Colloquium: A Three-Layer Paradigm for Collaboration 2. Sex Dependent User Interfaces and Software Development Peter Kokol (TF Maribor), Vlado Venuti (TP KVIK Maribor), Ivan Rozman (TF Maribor) and Andrej Kunej 3. Design of a GPG Automated System to Aid in Software Development 4. An Executable Prototyping Toolset for GUI and Functional Prototyping, Simulation, and Modeling James Sidoran (USAF Rome Laboratory), Daniel L. Moniz (Naval Undersea Warfare Center) and Hollis H. Bond 5. Development of a Library for Potential Reusable Software Components

Se	ssion FA-1: Applications	
1.	Machine Vision Versus Spectrophotometric Color Quality Control Robert Craven, James E. Smith (West Virginia University) and William K. Preece (Integral Vision Systems)	166
2.	Visualization of Two-Phase Flow Using Implicit Surfaces Izuru Shirai, Masashi Nakatani, Hirotada Ohashi and Mamoru Akiyama (University of Tokyo)	170
3.	Multimedia Data Collection/Communication Device for Construction Engineering and Management Liang Y. Liu (University of Illinois at Urbana-Champaign)	173
4.	Custom Designing GaAs-Based High-Speed Integrated Circuits Using MAGIC A. K. Goel, E. T. Ososanya, D. J. Peacock and T. S. Barber (Michigan Technological University)	177
Se	ession FA-2: Systems Modeling and Design	
1.	Modeling the Ethology and Control of Animal Groups Michael S. Wainer, Kenneth J. Danhof, George Waring and Janet B. Douglas (Southern Illinois University at Carbondale)	181
2.	Using Genetic Algorithms to Design Antenna Arrays Randy L. Haupt (USAF Academy)	185
3.	Exploring the Physics of Complex Systems with High Performance Computational Combinatorial Optimization J. F. Pekny (Purdue University)	189
4.	Aspects of Reasoning with Uncertainty in Heart Disease Donna L. Hudson (University of California, San Francisco), Maurice E. Cohen (University of California, San Francisco and California State University, Fresno), and Prakash C. Deedwania (University of California, San Francisco and Veterans Affairs Medical Center, Fresno)	193
Se	ession FP-1: Computer Aided Design/Manufacturing	
1.	An Intelligent Advisory System to Assist Plasma Torch Control Thomas Philip and Bert Nail (Mississippi State University)	197
2.	Computer Aided Manufacture of Dies for the Shoe Industry W. Booth, S. S. Ipson, Y. Li (University of Bradford), and D. C. Reedman (British United Shoe Machinery Ltd.)	201
3.	Computer-aided Assembly of Shoes using Surface Topographic Capture S. S. Ipson, W. Booth, T. J. Litt, P. Patrick (University of Bradford), C. J. Fine, M. Hudman, D. C. Reedman (British United Shoe Machinery Ltd.)	205
4.	The Variable Scale Transform M. Ricos and M. El-Sharkawy (Purdue University - Indianapolis)	209
5.	A Computer Aided Design Method for Hypersonic Configurations F. Farguson and S. Chandra (North Carolina A&T State University) and J. Blankson (NASA)	214